

contact with the secretions of susceptible healthy persons, and the danger is over. With the recovery of that person, that is to say, with restoration in him of a natural secretive process, the poison is destroyed; or should he unfortunately die, then with the death of his power to produce further secretion the danger is over, unless from his dead body some of the poison formed before the death be actually carried away to infect. In a word, if my theory be true, we sanitarians have complete mastery over the diffusion of the poisons of all the communicable diseases. We have but to keep steadily in view that the producing and reproducing power is in the affected body, and we can, even with our present knowledge, all but completely limit the action to the propagating power of that body—its power, I mean, of secretion and diffusion of secretion.

Beyond this, if the theory be true, we must expect, as we reduce the communicable diseases of one generation to reduce the tendency to them in the next generation, so that in time the heredity to particular spreading disease shall be thoroughly wiped out.

The theory suggests a profitable line of research on the subject of the production and reproduction of some of the poisons by the inferior animals and their transmission in that course to man. It brings all the inferior animals, in respect to their health and comfort, under our especial human care, not only for their sakes, but for our own self-preservation.

Finally, the theory suggests to those who are engaged in treating diseases of a communicable kind the best means of arresting the progress of a communicable disease even when the phenomena of it have been developed in an individual. It leads us physicians to take a precise view, in each such case, of the nervous and glandular processes that are out of the natural order of work; it suggests to us to seek for remedies amongst chemical agents which affect special secretions; and it shows us how to place the sick under such conditions that the secondary absorption of their own poisonous secretions,—that deep absorption which, according to my experience, is the actual cause of death in the great majority of cases of contagious disease,—may be avoided.

In every direction, in fine, in prevention and in cure, the glandular theory of the origin of the communicable diseases opens practical work and hopeful work.

I have for some time past sought for a favourable opportunity of once more putting forward this theory of the natural origin and cause of the communicable diseases of men and animals. The present is opportune to the fullest degree, and therefore I have seized on it. I am too earnest after search of truth for its own sake, too certain that in science everything false must fall, and everything true must remain, to feel any sense of anxiety as to the fate of my simple theory, by the side of the doctrine of a living contagium. If my doctrine be as true as I believe it to be, it will live, whatever force be arrayed against it. If it be not true, I would be of the first to welcome its end, and to hail the ascendancy of what is absolutely provable and certain on the momentous questions that have occupied our attention.

Meantime, I know I could not do a better thing for my own views than submit them once more to the public eye through the audience which has now so attentively listened to the argument.

NOTES

THERE has been a great deal of talk during the last few days, by prominent public men, on the advantages of some equivalent for university education for all the people, an education, too, in which science would be allotted a just place. Last week a Nottingham, the Earl of Carnarvon and Mr. Gladstone said much that was at least true on the advantages of an institution such as that newly founded at Nottingham, and each from his own standpoint lauded the advantages of wide culture for all classes.

Both Mr. Gladstone and Mr. Forster on Tuesday at Bradford seemed distinctly to approve of the movement for creating Owens College a University, and the only difficulty now seems to be the question of power to grant degrees. But surely those who are so eager on the latter point forget to distinguish between the shadow and the substance; the question of degrees will no doubt settle itself after the University has been established. Still we hardly sympathise with the trade-mark view of degrees propounded by Dr. Appleton in the *Times*. Bass's or Allsopp's label is imitated because their ales have a high and no doubt well-deserved reputation. But there were good ales before the names of either of the Burton brewers were heard of; there is the fine old Oxford ale, for instance, which, to judge by the public taste, has been improved upon by its new Burton rivals. Mr. Forster, however, we must say, seemed to think Oxford deserving of a word of praise for its present activity. Mr. Forster's address at Bradford was no mere essay on the beauty of culture, but the weighty utterance of a "practical" man who is forced to confess that he daily feels the immense disadvantage of having had no early training in science. He produced himself, in fact, as a practical comment on Sir John Lubbock's previous advocacy of the introduction of science into elementary schools. "His ignorance of science," he said, "his want of having been taught elementary laws of science when a boy, he felt every hour of his life, and it was too late now to learn. Science, if learnt at all, must be learnt in boyhood, and it was really disgraceful that in this civilised country, in this intellectual age, any one should be brought up in ignorance of the laws of nature, upon the breaking or keeping of which depended our happiness, our lives, and almost everything that relates to us. What a loss of pleasure, and what a different world the outside world of nature would be to him, if he could look around and understand the meaning of the various forces which were at work; and there was no doubt that a boy, even at an elementary school, if he learnt the elements there and went on afterwards, would get that kind of knowledge of the laws of science that it would become easy to him. There was a great talk about the dead languages. He was not going to say anything against them. Latin was almost a necessity to a man of culture, and Greek was of use; but why should nature, which spoke to us in so many ways, be a dead language to us? And therefore, if it came to this question—Whether we were to have classes on special subjects in elementary schools, classes for grammar, predicates, and a great many long words which he hoped nobody would examine him in, or for science—he certainly should go in favour of science." These are weighty words coming from a man of Mr. Forster's experience and "common sense," and indeed make us hope that things are progressing, and that we shall not now have long to wait before science is introduced not only into colleges, but into schools of all grades. Mr. Forster concluded by admitting that the German workers were superior to ours in the fact that they added to practical training scientific knowledge, and that he saw no reason why in secondary and even university education voluntary efforts should not be seconded by State aid.

M. YVON VILLARCEAU has been appointed "Administrateur Provisoire" of the Paris Observatory by an order of the Minister for Public Instruction, dated Saturday last. M. Villarceau held a similar office after the death of Delaunay, before the reappointment of Leverrier. Nothing has been said yet as to the appointment of a successor.

AT the Guy's Hospital *conversazione*, on Monday evening, a new government filter, invented by Major Crease, was shown, which reduced strong tea and infusions of logwood to clear tasteless water. The nature of the filtering material is not made known.

THE white whale, which was brought from America and placed in a tank (50 feet by 25) of fresh water in Westminster

Aquarium last Wednesday week, unfortunately died on Saturday morning. In the course of the first few hours after being put in the water the whole of the skin, piece by piece, peeled off, and after this the whale appeared to be more comfortable, fed well, and adopted a less restless style of swim. The change in its condition in two days was remarkable. In consequence of its journey it had been for twelve days without food, and it was on arrival so thin that the spinous processes formed a ridge two or three inches high along the back. In two days, however, feeding only on eels, it had regained its normal appearance, but, as we say, expired on Saturday morning. A post mortem examination was made by Prof. Flower and Prof. Garrod, assisted by Dr. Bond, of Westminster Hospital and Mr. Henry Lee. Everything was in a healthy condition except the lungs, which had quite lost elasticity, and in which inflammation had evidently been set up some time. Plastic pneumonia was the cause of death. The stomach, notwithstanding the twelve days' fast, had been working naturally, and some partly-digested eels were found. There was abundance of healthy-looking flesh in all parts of the body, which was not expected. The skeleton is to be exhibited at the Aquarium, and the viscera and brain have been presented to the College of Surgeons. The specimen was a partly-grown female Beluga or White Whale, nine feet six inches long. Prof. Wyman, of Harvard, published a description of one he dissected in the *Boston Journal of Natural History*, vol. vii., giving it Lesson's name, *Beluga borealis*. In Europe it is generally called *Delphinapterus leucas* (Pallas), the generic name being that given by Lacépède in 1804. Some of the daily papers have unfairly commented on the whale being put in fresh water. If the writers had taken the trouble to turn to "White Whale" in Bell, they would have found this statement: "It is abundant in Hudson's Bay, Davis Straits, and the Arctic Ocean generally. . . . It seems partial to large rivers; in America it ascends the River St. Lawrence as far as Quebec, and in Asia Schrenk and Nordmann state that it goes far up the River Amur." It is stated that one was kept in fresh water in New York for three years, fed on eels. The weight of the brain of this Westminster specimen has been ascertained by Prof. Flower to be 63 oz., an unusually high amount in proportion to the size of the animal. One peculiarity of this whale is that all the cervical vertebrae are separate. Several details of practical importance with reference to the carriage of large cetaceans have been learnt from this experiment, among the most important of which is the fact that unless the water-tank, in which it seems most reasonable to suppose that they would best travel, is sufficiently large to allow of the tail being brought well into action the creature is certain to be drowned from inability to reach the surface that it may breathe. Considering the difficulties attending the enterprise it is surprising how the animal arrived in this country without a trace of injury; and that inflammation of the lungs should have been the cause of death in an aquatic species was equally little to have been expected.

PROF. QUINCKE, the successor of Kirchhoff at Heidelberg, is now in this country inspecting the various laboratories and collections of apparatus.

THE long-talked of Conference of Librarians commenced its meetings on Tuesday at the London Institution under the presidency of Mr. Winter Jones, librarian of the British Museum. Several papers were read on Tuesday and yesterday bearing on the organisation and utility of libraries, and we trust that the multitude who have for one purpose or another to deal with books and libraries will reap much benefit and decrease of worry by this congress of library officials. We would strongly commend to the attention of the members of the congress the letter published last week, from Prof. Mallet, of Virginia, advocating the organisation of a staff of searchers in connection with all our great libraries. Even the most devoted laboratory-

worker must sometimes consult books, and it is desirable that this may be done with a minimum of waste of energy and time.

THE Birmingham and Midland Institute was opened for this session, on Monday, by Prof. Tyndall, who gave an interesting Address which we are glad to see is printed at full length in the *Times*.

ADVICES have been received from the Howgate Arctic schooner *Florence*, dated Cape Breton, August 8, up to which time the vessel had had a very comfortable and satisfactory passage. The arrangements for the accommodation of the naturalist and meteorologist prove to be quite ample and satisfactory, and already collections of natural history of some interest have been made.

OUR Paris correspondent writes that important news has been received from M. de Brazza, the leader of the expedition to the Ogové, West Africa. Brazza writes from Doumé, a village beside one of the numerous cataracts of the river, in $0^{\circ} 16' S$, and $13^{\circ} 20' E$. The river is stated to flow from the south for a considerable distance, when it turns southward at or across the equator. The natives inform Brazza that the Ogové stretches a long way eastwards, and it is thought possible that it may come from some interior lake. Brazza seems to think that the Libumba, an affluent of the right bank of the Congo, may be also connected with the Ogové. As we hinted last week, it seems probable, since Stanley's discovery, that the Congo and Ogové are connected in some way.

THE sea-coast branch of the United States Fish Commission has been at work for some time. The steam tug *Speedwell*, a powerful vessel of 300 tons, commenced operations at Salem, Massachusetts, about August 1. Unexpectedly rich results were obtained in that vicinity, embracing not only many rare forms of animal life, but much of practical importance to the fisheries. Several places were found abounding in fish previously unknown to the fishermen of Gloucester and Mablehead. Flounders of marketable size in immense numbers were taken of a species (*Glyptocephalus cynoglossus*) previously entirely unknown on the American coast. Leaving Salem on August 19, it arrived at Halifax on Wednesday the 22nd, trawling and dredging the greater part of the way. In the course of this journey many new animals were collected of much interest to naturalists, among them several species of Greenland fish hitherto never detected south of that country.

In Guido Cora's *Cosmos*, vol. iv. No. vi., we have an original chart of the Bay of Assab, accompanied by an elaborate description of the bay, the islands, and the adjacent continent, together with sailing directions. It appears to be somewhat better than the Red Sea Chart issued by the English Admiralty, but probably a drawing on a larger scale by Moresby or others is lying at the Hydrographical Office. The bay is on the African Coast, and is about forty miles from Perim Island, at the mouth of the Red Sea, and the same distance from Mocha. The most interesting point of this chart is that an area of some four miles by one mile and a-half is claimed for Italy.

M. HERPIN, an old professor of mathematics and cosmography, is about to publish, through Baudry of Paris, an astronomical dictionary, quite a novelty in French scientific literature, since the astronomical part of the great *Encyclopædia* was published at the end of the last century.

AN International Congress of Botany and Horticulture will be held at Paris during the International Exhibition next year. The Congress will open on August 16, 1878, and will last a week.

THE Cunard steamer *Abyssinia*, which arrived at Queenstown on Sunday, experienced fearful weather from the 22nd to 27th ult.—gales from west, north-west, to north. On the 25th, lat. $45^{\circ} 38' N$, long. $41^{\circ} 56' W$, she met a cyclone from north, and

was hove to for twenty-seven hours. This is believed to be a cyclone which recently started from the American coast and which thus vanished in the ocean.

THE geological survey of Brazil, which has been in progress for several years under the direction of Prof. C. F. Hartt, formerly of Vassar and Cornell Universities, United States, was lately for a short time threatened with suspension, but the proposal was countermanded and increased strength given to the commission after an investigation of all the circumstances. The temporary stoppage of operations was used advantageously by Prof. Hartt in placing the collections made by him in good order, and his parties have again entered the field in prosecution of their objects. Among the more important results so far accomplished by the survey has been the discovery of the existence in Brazil of the silurian, Devonian, carboniferous, triassic, Jurassic, cretaceous, and post-tertiary formations, all of them furnishing well-characterised fossils in great variety, and of which large numbers have been collected by the commission for its investigation, and for purposes of distribution in Brazil and of exchange with foreign establishments. So far no well-defined tertiary has been found to exist in Brazil. The survey has also been very successful in its ethnological researches, especially among the kitchen-middens of Santa Catharina, Paraná, Sao Paulo, Bahia, and the Amazonas, the results of which have been announced in part, although much of interest yet remains to be published. The researches in the coral reefs have been made the occasion of securing numbers of marine animals, all of which add to the resources of the survey. In connection with other operations, numerous photographs of scenery, of geological structure, and of the native races, have been taken.

THE death of Dr. Abraham Sager, an eminent anatomist and physiologist of the United States, took place on the 6th of August last. Dr. Sager, in 1837, was placed in charge of the botanical and zoological departments of the Michigan Geological Survey, and embraced this and subsequent opportunities to make large collections, which are now the property of the Michigan University. His investigations into the embryology and development of the tailed batrachians have added much to our knowledge of those forms.

THE bust of Sir Thomas Stamford Raffles, F.R.S., first president of the Zoological Society of London, has been placed in the new lion house of the Society's Gardens.

THE following foreign works have been sent us by Messrs. Williams and Norgate:—"Die kinetische Theorie der Gase," by Dr. Oskar Emil Meyer (Breslau); "Christian Gottfried Ehrenberg," by Johannes Hanstein (Bonn); "Phénomènes physiques de la Phonation," by J. Gadarret (Paris); "Ergebnisse physikalischer Forschung," by Dr. C. Bohn (Leipzig); "Physiologische Methodik," by Dr. Richard Gschiedlen (Braunschweig); "Synopsis Rubarum Germaniæ," by Dr. W. O. Focke (Bremen); "Lehrbuch der Analysis," by Rudolph Lipschitz: vol. I. (Bonn).

DR. F. A. FOREL, of Geneva, an energetic advocate of the doctrine of evolution, in an article published in the August number of the *Archives des Sciences physiques et naturelles*, proposes the application of natural selection for successfully healing certain diseases of silkworms, and also for rendering the European species of vines proof against the attacks of phylloxera. In the first matter experiments have already been made to a certain extent, and have been crowned with perfect success; in the case of vines the experiments are still to be made. The September number of the same journal, which is unusually bulky, is entirely devoted to a detailed biography of Auguste de la Rive,

who died on November 23, 1873, at the age of seventy-two years.

WE have received a letter from Dr. Emil Bessels with reference to the *Polaris* observations (NATURE, vol. xvi. p. 358), and have much satisfaction in learning that it is proposed to revise the averages of the barometrical and thermometrical observations of the *Polaris* Arctic Expedition, these having been somewhat hastily prepared and published from a desire to have the report out before the expedition to the North Polar regions sailed from England.

A TELEGRAM from New York, September 30, states that the American Consul at St. John's (Newfoundland) has purchased from a seaman who was wrecked in Hudson's Bay, two spoons supposed to be relics of the Franklin Expedition, one of them being marked "J. G. F." It is said that Esquimaux living in the neighbourhood of Repulse Bay got them from a native chief, at whose camp the original owner, a white man, had died of scurvy. This statement does not seem quite consistent with the known facts as to the fate of the Franklin Expedition; moreover, we are not aware that "J. G. F." are Franklin's initials.

THE Museum of the Royal College of Surgeons of England has received as a present from the Hon. Charles P. F. Berkeley, the skeleton of a crocodile 15 feet 9 inches in length, which was shot by that gentleman last winter near Hagar Silsilis, in Egypt.

THE Swiss *Bundesrath* announces that the construction of the St. Gothard Tunnel is proceeding with increasing rapidity, and will probably be completed within three years.

THE seventh number (1877) of the *Bulletin* of the Belgian Academy of Sciences, contains a valuable paper, by M. C. Lagrange, "On the Influence of the Form of Bodies on their Attraction." This question, very incidentally treated by Brück, is thoroughly discussed by M. Lagrange, who arrives at some important conclusions. Discussing the attraction exercised by a body of irregular forms on a point situated at different distances from the centre of inertia of the body, and in different positions relatively to its axis of maximum and minimum inertia, the author proves that the attraction is directed to the centre of inertia only when the point is situated on one of the principal axes of inertia of the body; and that, at equal distances the attraction reaches its maximum when the point is on the axis of minimum inertia, and inversely, this maximum exceeding, and the minimum being less than, the attraction which would have been exercised were the whole mass of the body concentrated in its centre. Further, the author discusses the attraction exercised on a moving point, and arrives at the conclusion that the point, while attracted to the centre, will also receive an angular motion around the latter. Finally, he discusses the reciprocal attraction of two free bodies of irregular form, and; after having shown when the attraction will reach a maximum and a minimum, he proves also that the attraction will communicate to both bodies a rotatory motion, tending to bring into coincidence their axes of minimum inertia. In the two last paragraphs of his paper, M. Lagrange briefly notices the applications the principles he establishes may have in explaining the rotatory motion of the sun, as well as in accounting for crystallisation, further researches, not yet published, having enabled the author to account for the formation of different crystalline systems in a way which makes the whole question a problem of rational mechanics. The memoir is spoken of in very high terms by MM. Van der Mensbrugghe, Catalan, and De Tilly, who analysed it by order of the Academy.

No. VIII. of the *Bulletin* of the United States National Museum consists of an "Index to the names which have been applied to the subdivisions of the class Brachiopoda," by Mr. W. H. Dall.

THE author of the work in the "Naturkräfte" series, on "Die Insecten," noticed in NATURE for September 13 (p. 418) is not Dr. Georg Mayr, but Prof. Vitus Graber, of Czernowitz University, the well-known author of numerous interesting monographs on insect anatomy and histology.

THE additions to the Zoological Society's Gardens during the past week include a Robben Island Snake (*Coronella phocorum*) from South Africa, presented by the Rev. G. H. R. Fisk; a Chimpanzee (*Troglodytes niger*) from West Africa, a Leonine Monkey (*Macacus leoninus*) from Arracan, a White-fronted Capuchin (*Cebus albifrons*), a Laughing Gull (*Larus atricilla*) from South America, deposited; a Greater Sulphur-crested Cockatoo (*Cacatua galerita*), from Australia, presented by Mr. G. S. S. Williams; two Red-backed Shrikes (*Lanius collurio*), European, presented by Capt. F. H. Sahn; two Spotted Turtle Doves (*Turtur suratsensis*), bred in the Gardens.

INTRODUCTION AND SUCCESSION OF VERTEBRATE LIFE IN AMERICA¹

III.

THE artiodactyles, or even-toed ungulates, are the most abundant of the larger mammals now living, and the group dates back at least to the lowest eocene. In every vigorous primitive type which was destined to survive many geological changes, there seems to have been a tendency to throw off lateral branches which became highly specialised and soon died out because they are unable to adapt themselves to new conditions. The narrow path of the persistent suilline type throughout the whole tertiary is strewn with the remains of such ambitious offshoots, while the typical pig, with an obstinacy never lost, has held on in spite of catastrophes and evolution, and still lives in America to-day. The genus *Platygonus* is represented by several species, one of which was very abundant in the post-tertiary of North America, and is apparently the last example of a side branch, before the American suillines culminate in existing peccaries. The feet in this species are more specialised than in the living forms, and approach some of the peculiar features of the ruminants; as, for example, a strong tendency to coalesce in the metapodial bones. The genus *Platygonus* became extinct in the post-tertiary, and the later and existing species are all true peccaries. No authenticated remains of the genera *Sus*, *Porcus*, *Phacocheirus*, or the allied *Hippotamus*, the Old World suillines, have been found in America, although several announcements to that effect have been made.

In the series of generic forms between the lower eocene *Eolhyus* and the existing *Dicotyles*, which I have very briefly discussed, we have apparently the ancestral line ending in the typical American suillines. Although the demonstration is not yet as complete as in the lineage of the horse, this is not owing to want of material, but rather to the fact that the actual changes which transformed the early tertiary pig into the modern peccary were comparatively slight, so far as they are indicated in the skeletons preserved, while the lateral branches were so numerous as to confuse the line. It is clear, however, that from the close of the cretaceous to the post-tertiary the bunodont artiodactyles were especially abundant on this Continent, and only recently have approached extinction.

The selenodont division of the artiodactyles is a more interesting group, and so far as we now know, makes its first appearance in the upper eocene of the west, although forms apparently transitional between it and the bunodonts occur in the dinocerat beds, or middle eocene. The most pronounced selenodont in the upper eocene is the *Oromeryx*, which genus appears to be allied to the existing deer family, or *Cervidae*, and if so is the oldest known representative of the group. These facts are important, as it has been supposed, until very recently, that our eocene contained no even-hoofed mammals.

A most interesting line, that leading to the camels and llamas, separates from the primitive selenodont branch in the eocene, probably through the genus *Parameryx*. In the miocene, we find in *Pachotherium* and some nearly allied forms unmistakable indications that the cameloid type of ruminant had already

become partially specialised, although there is a complete series of incisor teeth, and the metapodial bones are distinct. In the pliocene the camel tribe was, next to the horses, the most abundant of the larger mammals. The line is continued through the genus *Procamelus*, and perhaps others, and in this formation the incisors first begin to diminish, and the metapodials to unite. In the post-tertiary we have a true *Auchenia*, represented by several species, and others in South America, where the alpacas and llamas still survive. From the eocene almost to the present time North America has been the home of vast numbers of the *Camelidae*, and there can be little doubt that they originated here and migrated to the Old World.

The deer family has representatives in the upper miocene of Europe, which contains fossils strongly resembling the fauna of our lower pliocene, a fact always to be borne in mind in comparing the horizon of any group in the two continents. Several species of *Cervidae*, belonging to the genus *Cosoryx*, are known from the lower pliocene of the west, and all have very small antlers, divided into a single pair of tynes.

The proboscideans, which are now separated from the typical ungulates as a distinct order, make their first appearance in North America in the lower pliocene, where several species of mastodon have been found. This genus occurs also in the upper pliocene and in the post-tertiary, although some of the remains attributed to the latter are undoubtedly older. The pliocene species all have a band of enamel on the tusks, and some other peculiarities observed in the oldest mastodons of Europe, which are from essentially the same horizon. Two species of this genus have been found in South America, in connection with the remains of extinct llamas and horses. The genus *Elephas* is a later form, and has not yet been identified in this country below the upper pliocene, where one gigantic species was abundant. In the post-pliocene remains of this genus are numerous. The hairy mammoth of the Old World (*Elephas primigenius*) was once abundant in Alaska, and great numbers of its bones are now preserved in the frozen cliffs of that region. This species does not appear to have extended east of the Rocky Mountains, or South of Columbia River, but was replaced there by the American elephant, which preferred a milder climate. Remains of the latter have been met with in Canada, throughout the United States, and in Mexico. The last of the American mastodons and elephants became extinct in the post-tertiary.

Perhaps the most remarkable mammals yet found in America are the *Tillodontia*, which are comparatively abundant in the lower and middle eocene. These animals seem to combine the characters of several different groups, viz., the carnivores, ungulates, and rodents. In the genus *Tillotherium*, the type of the order, and of the family *Tillotheridae*, the skull resembles that of the bears; the molar teeth are of the ungulate type, while the large incisors are very similar to those of rodents. The skeleton resembles that of the carnivores.

We now come to the highest group of mammals, the primates, which includes the lemurs, the apes, and man. This order has a great antiquity, and even at the base of the eocene we find it represented by several genera belonging to the lower forms of the group. In considering these interesting fossils it is important to have in mind that the lemurs, which are usually regarded as primates, although at the bottom of the scale, are only found at the present day in Madagascar and the adjacent regions of the globe. All the American monkeys, moreover, belong to one group, much above the lemurs, while the Old World apes are higher still, and most nearly approach man.

In the lower eocene of New Mexico we find a few representatives of the earliest known primates, and among them are the genera *Lemuravus* and *Limnotherium*, each the type of a distinct family. These genera became very abundant in the middle eocene of the West, and with them are found many others, all, however, included in the two families *Lemuraviidae* and *Limnotheriidae*.

In the miocene lake basins of the West only a single species of the *Primates* has been identified with certainty. This was found in the oreodon beds of Nebraska and belongs to the genus *Laopithecus*, apparently related both to *Limnotheriidae* and to some existing South American monkeys. In the pliocene and post-pliocene of North America no remains of primates have yet been found.

In the post-pliocene deposits of the Brazilian caves remains of monkeys are numerous, and mainly belong to extinct species of *Callithrix*, *Cebus*, and *Jacchus*, all living South American genera. Only one extinct genus, *Protopithecus*, which em-

¹ Abstract of a lecture delivered at the Nashville meeting of the American Association, August 30, by Prof. O. C. Marsh. Continued from p. 472